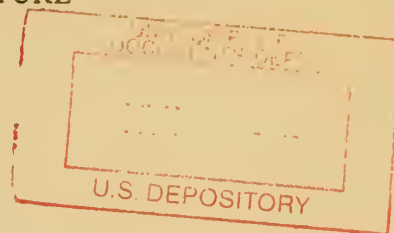


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UNITED STATES DEPARTMENT OF AGRICULTURE  
Bureau of Agricultural Economics

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USE OF THE OFFICIAL COTTON STANDARDS  
OF THE UNITED STATES  
(In Sales to Domestic Mills)

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By J. W. Wright,  
Senior Agricultural Economist  
Division of Cotton Marketing

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A Preliminary Report

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Washington, D. C.  
December 1934

The effectiveness of the official cotton standards of the United States as an instrumentality for facilitating the marketing of raw cotton and for reflecting back to growers the quality preferences of users of cotton is conditioned materially upon the extent of use of the standards throughout the marketing system. This report covers one phase of a broader study of the use of the official standards by various groups in the cotton industry.

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INTRODUCTION

The official standards of the United States for cotton, established under the provisions of the Cotton Futures Act 2/ and the Cotton Standards Act, 3/ were designed to fill a recognized need for a uniform method of describing the various elements and combinations of elements of quality in raw cotton. The record of the hearings held when these Acts were under consideration in Congress indicates that it was the general opinion of those who had given the subject careful study that the marketing of American cotton would be facilitated materially by the adoption of a uniform method for describing quality as the basis for purchases and sales of raw cotton throughout the entire market

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1/ The study upon which this report is based was planned in collaboration with H. C. Slade, Senior Marketing Specialist, and R. W. Webb, Senior Cotton Technologist. The field data were collected by E. F. Buffington, Senior Specialist in Cotton Classing, W. I. Holt, Senior Specialist in Cotton Classing, J. G. Martin, Senior Specialist in Cotton Classing, and John B. Grimball, Associate Agricultural Economist, supplemented in certain instances by the field staff of the Grade and Staple Statistics Section. Mr. Grimball assisted also with the preliminary tabulation of the data. The study was made possible by the cooperation, in supplying data, of 334 domestic cotton mills, the Cotton States Arbitration Board, and the New England Classification Committee.

2/ Act of August 11, 1916. 39 Stat. L., 476.

3/ Act of March 4, 1923. 42 Stat. L., 1517.

chain from grower to spinner. 4/ The Cotton Standards Act provides that when any grade or other description of quality is indicated in connection with transactions or shipments of American raw cotton in commerce, the official cotton standards shall be used; except that actual samples or private types may be used when not in evasion of or substitution for the official standards. Apparently this exception was made because of the recognized difficulty in providing standards for the element of character. But in effect, the exception makes the use of the official standards permissive rather than mandatory for many types of transactions in raw cotton.

Subsequent to the establishment of the official standards, cotton cooperative associations generally, and other types of marketing agencies in many instances, have adopted the practice of basing their settlements with growers on these standards. Transactions intermediate between growers and spinners in most instances involve direct or indirect reference to the official standards. Indications are, however, that before the official standards can be fully effective as a basis for purchasing cotton from producers, the manufacturers as well as intermediate marketing agencies must also make full use of them.

This report deals with a study designed to provide more complete information relative to the procedure followed by domestic cotton mills in procuring raw cotton and to indicate wherein the official standards may be improved and their use extended as the basis for quality specifications in mill-purchase transactions. To supply the information desired, provision was made for ascertaining (1) the marketing channels through which domestic mills procure raw cotton, (2) the means now employed for specifying mill requirements with respect to quality, (3) the extent to which the official standards in their present state of development are inadequate in meeting mill requirements as a means for describing quality from the standpoint of spinning utility, (4) the means employed by mills that use the official standards for supplementing them in order to specify more precisely the qualities of cotton desired, (5) the extent to which receipts of cotton at domestic mills meet purchase specifications under present methods of describing quality and the means by which adjustments are made for deficiencies in quality, and (6) the necessity for improvements in the existing standards and of providing standards for additional factors of quality.

#### SOURCES OF DATA

Data as to the procedure of mills in purchasing cotton and in describing cotton quality for the season 1930-31 were secured by personal visits of members of Boards of Cotton Examiners and others to 334 mills located in the principal

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4/ U. S. Congress, House of Representatives. Hearing before the Committee on Agriculture, 63rd Congress, August 10 and 12, 1914.

U. S. Congress, House of Representatives. Hearing before the Committee on Agriculture, 67th Congress, 4th Session, February 5, 9, and 12, 1923. Series J. J.

U. S. Congress, Senate. Hearing before the Committee on Agriculture and Forestry on H. R. 14302, 67th Congress, 4th Session, February 20 and 24, 1923.

cotton-spinning centers in the cotton-producing States and in the Northeast. The mills from which data were obtained included approximately 30 percent of the spinning establishments in operation in the United States during the season 1930-31 and represented approximately 35 percent of the total United States consumption of cotton during that season. The mills selected for this study included various sizes of plants and represented the manufacture of a wide range of cotton products.

A test of the adequacy of the sample of mills for the purpose of this study was made by comparing the proportions of the various staple lengths of cotton consumed by the selected mills in 1930-31 with similar tentative figures indicating the proportions of these staples consumed during the same year by all cotton mills in the United States. Such adjustments were then made in the selection of mills as would make the proportions of the several staple lengths found in the consumption of selected mills approximate the proportions indicated for all domestic mills. It is believed that the data obtained and here presented are representative of actual conditions in the domestic textile industry during the year studied.

In the analysis of the data the results were first tabulated for all mills regardless of type of yarn spun or quality of cotton used. Subsequently the mills were divided into 3 groups based on the staple length of the major portion of the raw cotton used, to determine to what extent cotton of various lengths presents different problems to spinners from the standpoint of describing the various elements of quality and of securing cotton of the qualities desired. One group included mills using cotton shorter than 1 inch in staple length; another included those mills using staples from 1 inch to 1-3/32 inches inclusive; the third group included those mills using cotton of staple lengths 1-1/8 inches and longer.

Data concerning arbitrations for quality between domestic mills and selling agencies for the four seasons 1929-30, 1930-31, 1931-32, and 1932-33 were abstracted from the records of the trade arbitration boards and were tabulated to show the extent of the use of the various methods of specifying quality requirements on cotton submitted for arbitration.

#### MARKETING CHANNELS THROUGH WHICH DOMESTIC MILLS PROCURE RAW COTTON

The marketing channels through which manufacturers procure their raw cotton depends, in each instance, upon the location of the mill with respect to the locality of growth of the particular quality or qualities of cotton used and, to some extent, upon the size and financial position of the manufacturing establishment itself. Many mills located in cotton-producing areas are able to procure the qualities of cotton required for their purposes by direct purchase from growers or from local marketing agencies that perform the service of assembling the cotton into lots of sufficient size to permit of more advantageous purchase by the mill buyers. Mills located in noncotton-producing areas and mills using cotton of qualities not produced locally usually find it necessary or advantageous to buy through marketing agencies that are equipped to deliver cotton of the qualities and in the quantities desired. Mills that

Table 1. - Percentage distribution of purchases of raw cotton by domestic mills in cotton-growing States and in other States, by type of selling agency and of purchase transaction, season 1930-31

Type of selling agency	All domestic mills			Mills in cotton-growing States			Mills in other States		
	Fixed price	On call	Total purchased	Fixed price	On call	Total purchased	Fixed price	On call	Total purchased
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Growers direct.....	7	-	7	9	-	9	-	-	-
Country merchants and buyers.....	11	2	13	14	2	16	-	-	-
Shippers direct.....	7	11	18	9	13	22	2	3	5
Shippers through brokers.....	8	19	27	5	16	21	19	31	50
Cotton merchants.....	5	11	16	5	7	12	4	26	30
Cooperatives direct.....	2	10	12	2	13	15	-	1	1
Cooperatives through brokers..	2	5	7	1	4	5	6	8	14
Total.....	42	58	100	45	55	100	31	69	100

Estimates based on data obtained through a survey of domestic cotton mills.

purchase cotton on a hand-to-mouth basis usually procure cotton from cotton merchants who maintain stocks of cotton of the quality desired that can be delivered on short notice.

The relative importance of the various types of marketing agencies in supplying raw cotton to domestic mills in cotton-producing States and in other States is indicated in table 1. For the season 1930-31 about 7 percent of all mill purchases were made direct from growers, 13 percent from country merchants and buyers including ginnerers, 18 percent from shippers directly, 27 percent from shippers through brokers, 16 percent from cotton merchants, 12 percent from cooperatives directly, and about 7 percent from cooperatives through brokers. Mills located in cotton-growing States purchased approximately 25 percent of their cotton from local sources including growers, country merchants, and ginner-buyers. About 43 percent of the raw cotton supplies of mills in cotton-growing States were purchased from shippers, either direct or through brokers. Similar agencies supplied mills in noncotton-growing States to the extent of about 55 percent of their cotton. Cooperatives either directly or through brokers supplied a relatively larger quantity of cotton to mills in cotton-growing States than to mills located outside of the Cotton Belt, the percentages being 20 and 15 for the two areas, respectively. Cotton merchants were a much more important factor in supplying mills in noncotton-growing

States than in cotton-growing States, the percentages of total cotton supplied from this source being 30 percent and 12 percent, respectively, for the two groups. Likewise purchases were made through brokers to a greater extent by mills in noncotton-growing States than by mills in cotton-growing States. Almost 65 percent of all purchases were made through brokers by mills located outside of the Cotton Belt as compared with about 25 percent for mills in the South.

Purchases of cotton by manufacturers may be at fixed prices or "on call." This detail of the purchase transaction usually depends upon whether the product in which the raw cotton is to be used has been sold for forward delivery or is being manufactured for stock. If the products have been sold prior to their manufacture, the raw cotton can be purchased at a fixed price without the manufacturer having to assume the risk of price fluctuations. On the other hand, if the spinner is manufacturing for stock, he must either assume this risk or secure a hedge in connection with the purchase of his raw cotton. Such a hedge is provided by making an "on call" purchase of the cotton in which the price basis with respect to a futures month is agreed upon, leaving the actual price to be fixed when the product has been sold. This procedure relieves the manufacturer of the necessity of executing futures contracts, placing this responsibility upon the seller of the raw cotton. Manufacturers usually prefer to have this service performed for them by the marketing agencies through which their purchases are made.

For the season 1930-31 approximately 42 percent of all purchases of cotton by domestic mills were made at fixed prices, and about 58 percent were made "on call" (table 2). Cotton of the longer staples was purchased "on call" to a greater extent than was short-staple cotton. Similarly, mills in the noncotton-growing States purchased cotton "on call" to a much greater extent than did mills located in the South (table 1). But there was considerable variation in the basis of purchases made through different types of selling agencies. Cotton was purchased "on call" to a greater extent when purchased through brokers than when purchased direct.

#### MEANS EMPLOYED BY DOMESTIC MILLS FOR SPECIFYING REQUIREMENTS WITH RESPECT TO QUALITY

Means employed by manufacturers for specifying their requirements with respect to cotton quality have undergone a gradual evolution since the early development of commercial spinning. During the early period, bales of cotton were purchased by spinners or their agents either without regard to quality or by an examination of the bales at the seller's warehouse. <sup>5/</sup> As methods of packing improved with the extension of the cotton industry and as greater attention was given to differences in quality, spinners adopted the practice of making their purchases from samples submitted to them instead of

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<sup>5/</sup> Hammond, M. B. The Cotton Industry - An Essay in American Economic History. American Economic Association. December 1897. Page 280.

Table 2. - Purchases of raw cotton by domestic mills by staple length and type of transaction, season 1930-31

Staple length of cotton purchased	Type of transaction	
	Fixed price	On call
	Percent	Percent
Shorter than 1 inch.....	46	54
1 to 1-3/32 inches.....	37	63
1-1/8 inches and longer.....	35	65
All lengths.....	42	58

Estimates based on data obtained through a survey of domestic cotton mills.

visiting the warehouse of the seller. 6/ The next step was the adoption of type samples to designate qualities desired.

The mechanical difficulties involved in maintaining private types together with the development of more rapid modes of communication and of forward trading, made necessary the adoption of standards of quality as the basis for the purchase and sale of raw cotton. In an attempt to meet this need, various cotton organizations established their own standards. This procedure was not satisfactory because of the lack of uniformity in the standards established by the different organizations and because of the absence of any definite policy with respect to changes in the standards of the various organizations. 7/ The need for uniform standards and for a definite policy with respect to such standards was met, so far as American cotton is concerned, by the establishment of official standards for raw cotton under the provisions of the United States Cotton Futures and Cotton Standards Acts. The official standards thus established have replaced the standards of the various trade organizations.

The establishment of the official standards has not eliminated other methods of purchasing cotton for quality, as many domestic mills still make their purchases from actual samples or base them on private types. Types used may be those maintained by the mill itself or those supplied by shippers, merchants, or cooperatives. Although a mill in making purchases of raw cotton may designate certain qualities as represented by the official standards or by private types, the cotton may be approved on actual samples.

### Grade

For the season 1930-31 approximately 68 percent of all domestic-mill purchases of raw cotton were described for grade by reference to the official standards, 14 percent were based on mill types, 9 percent on the types of merchants, shippers, or cooperatives, and 9 percent on actual samples (table 3).

6/ Ibid. pp. 282, 290.

7/ United States Department of Agriculture, Universal Standards for American Cotton with a Brief History of the Movement to Secure Universal Cotton Standards, (Mimeographed) pp. 14-23.

Table 3. - Percentage distribution of domestic-mill purchases of raw cotton described for grade and staple length by specified methods, season 1930-31

Means employed for specifying grade and staple length	Grade	Length of staple
	Percent	Percent
Official standards.....	68	48
Mill types.....	14	29
Types of merchants, shippers, and co- operatives.....	9	14
Actual samples.....	9	9
Total purchases.....	100	100

Estimates based on data obtained through a survey of domestic cotton mills.

Approximately 50 percent of the mills that consume upland cotton of staple lengths 1-1/8 inches and longer based their purchases, for this type of cotton, on the tentative standards for preparation. The information assembled in connection with this study indicates that those mills that make use of the preparation standards have found them the most effective means available for specifying requirements with respect to neppiness in cotton. In some cases the tentative standards for preparation of long-staple cotton (1-1/8 inches and longer) were used for this purpose even when the cotton purchased was of staples shorter than 1-1/8 inches.

All manufacturers interviewed in connection with this study were requested to express an opinion as to the advisability of establishing separate standards for preparation for cotton of staples shorter than 1-1/8 inches. Twelve percent of the manufacturers advocated the establishment of such standards, 72 percent did not consider them necessary, and 16 percent declined to express an opinion.

In many instances manufacturers had not had experience with the tentative standards for preparation and not infrequently they did not know of their existence.

Some of the mills in the Northeast advocated the establishment of separate grade standards for long-staple cotton.

An analysis of the arbitrations between domestic cotton mills and marketing agencies involving disputes as to quality from the standpoint of grade indicates the extent to which the official grade standards were used separately and in various combinations during the 4-year period, 1929-30 to 1932-33 (table 4). During this period approximately 64 percent of the cotton involved in transactions submitted to arbitration for grade was described according to the

Table 4. - Proportionate use of various means employed for specifying grade for cotton submitted by domestic mills for arbitration, seasons 1929-30 to 1932-33

Means employed for specifying grade	1929-30	1930-31	1931-32	1932-33	4-year average 1/
	Percent	Percent	Percent	Percent	Percent
U. S. standards:					
Straight grades.....	71.4	67.8	48.9	51.7	63.6
Split grades.....	6.7	7.8	6.6	3.2	6.3
Tentative preparation standards.....	1.8	3.7	1.2	.3	1.8
Straight grades and preparation standards..	.8	2.4	10.8	15.6	5.2
Split grades and preparation standards.....	.7	5.2	6.4	10.2	4.1
Total U. S. standards.....	81.4	86.9	73.9	81.0	81.0
Private types.....	18.0	12.9	26.0	18.5	18.6
Private types with official grade standards.....	.6	.2	.1	.3	.4
Private types with tentative preparation standards.....	-	-	-	.1	-
Private types, grade standards, and preparation standards.....	-	-	-	.1	-
Total.....	100.0	100.0	100.0	100.0	100.0

Data compiled from records of trade arbitration boards.

1/ Based on total bales involved during 4-year period.

straight grades 8/ of the official standards. Transactions in which the question at issue was preparation only, and in which the cotton was described for this factor of quality on the tentative standards for preparation of long-staple cotton, included less than 2 percent of the cotton submitted to arbitration. Descriptions were made in terms of split grades 9/ for about 6 percent of the cotton and by means of split grades in combination with the tentative standards for preparation for about 4 percent. Approximately 5 percent of this cotton was described for grade by reference to the official grade standards for the factors of color and leaf, and to the tentative standards for preparation of long-staple cotton for the factor of preparation.

About 19 percent of the cotton submitted to arbitration for grade was described in terms of private types. Negligible quantities involved the use of official grade standards and the tentative standards for preparation in combination with private types.

8/ The term "straight grade" as used herein refers to the composite of the three factors of grade -- color, leaf and preparation -- as represented by a single grade box of the official standards.

9/ The term "split grade" as used herein refers to a description in which the grade factors are designated separately by reference to two or more grade boxes of the official standards.

Table 5. - Proportionate use of the United States staple standards and private types for specifying staple length for cotton submitted by domestic mills for arbitration, seasons 1929-30 to 1932-33

Means employed for specifying staple length	1929-30	1930-31	1931-32	1932-33	4-year average 1/
	Percent	Percent	Percent	Percent	Percent
U. S. staple standards.....	43.5	53.2	47.3	67.7	50.1
Private types.....	56.5	46.8	52.7	32.3	49.9
Total.....	100.0	100.0	100.0	100.0	100.0

Data compiled from records of trade arbitration boards.

1/ Based on total bales involved during 4-year period.

### Staple

The official standards for staple length were used much less extensively by domestic mills as a basis for their purchases of cotton than the official grade standards. Approximately 48 percent of all purchases were based on the official staple standards, 29 percent on mill types, 14 percent on merchants, shippers, and cooperative types, and about 9 percent were purchased from actual samples displayed by merchants or brokers (table 3).

The extent to which cotton submitted to arbitration was described for staple on the official staple standards and on private types is shown in table 5. The two methods were used to an approximately equal extent as a means of specifying quality requirements in such instances.

The continued extensive use of private types as a means for describing requirements with respect to staple was reported by many mills to be due to the fact that the element of character is not considered to be adequately provided for in the official standards for staple length. Since character is generally considered to be a factor in spinning utility, private types, particularly the mills' own types, were considered by many mills to be the most satisfactory of the available means for specifying staple length and character in the absence of official standards for character.

Mill buyers who had given careful thought to this subject, however, recognized the fact that the use of private types has been the source of considerable misunderstanding and controversy between the mills and the selling agencies. Such misunderstandings usually involve the identity or representativeness of different portions of private types held by various parties. The official standards, on the contrary, always carry their own identification marks and are always available. Moreover, the Cotton Standards Act requires public notice a full year in advance of any change or revision.

The use of private types, particularly sellers' types, as the means for describing quality requirements tends to limit a mill's available source of supply to that of the selling agency whose type is being used. On the other hand, when quality requirements are specified on the basis of the official standards, a broader market from which to buy is made available.

### Character

Official standards for character have not been established, but in the standards for length of staple, provision has been made for including only cotton that represents the prevailing conception of normal, sound character for each staple length. Therefore, mills requiring cotton that is normal in character, as represented by the official staple standards, can use these standards effectively. Mills requiring cotton other than normal in character as represented by the official staple standards can use these standards as their basing point by specifying, in appropriate supplementary descriptive terms, the specific character of cotton required as compared with that represented in the official standards for the staple length desired.

Means customarily employed by mills that do not base their specifications with respect to character on the official standards for staple include the use of (1) private types in connection with which "equal to type" usually is specified, (2) descriptions as to character of fiber required in terms of "hard bodied," variety of cotton, and various other designations, and (3) specification as to locality of growth.

In the majority of cases two or more of the methods are used in combination. Table 6 indicates the extent to which each was used singly or in combination during the season 1930-31.

"Equal to type" and other descriptive terms were used to a greater extent by mills consuming short-staple cotton than by mills consuming cotton of the longer staples. The reverse was true with respect to the use of geographic designations, only about 15 percent of the cotton being described for character in terms of origin for mills using cotton under 1 inch in staple length, whereas 48 percent of the cotton 1-1/8 inches and longer was described for character by this method.

Approximately 25 percent of all purchases in connection with which character was specified were described by means of type in combination with origin, about 35 percent were based on descriptive terms in combination with origin, and for about 2 percent all three -- "equal to type," descriptive terms, and geographic designations -- were used in combination.

For the 4-year period 1929-30 to 1932-33, approximately 87 percent of the cotton involved in transactions submitted for arbitration in

Table 6. - Proportionate use of various means employed by domestic mills for specifying requirements with respect to character in raw cotton purchases by staple-length groups, season 1930-31

Manner of specifying requirements with respect to character	All cotton	Mills grouped according to staple length of major part of cotton consumed		
		Shorter than 1 inch	1 to 1-3/32 inches	1-1/8 inches and longer
	Percent	Percent	Percent	Percent
Equal to type.....	9.1	13.4	4.8	3.4
Descriptive terms.....	9.4	15.1	4.0	.9
Geographic designations.....	19.3	15.1	11.9	4.8
Equal to type and geographic designations.....	25.1	21.6	35.0	17.1
Descriptive terms and geographic designations.....	34.9	32.8	41.0	29.8
Equal to type, descriptive terms, and geographic designations....	2.2	2.0	3.3	.7
Total.....	100.0	100.0	100.0	100.0

Estimates based on data obtained through a survey of domestic cotton mills.

which character was a question at issue was described for this element of quality in terms of private types (table 7). Specifications for character in terms of the official staple standards were used for about 3 percent of the cotton. For a negligible quantity requirements as to character were based solely on origin. The official staple standards in combination with origin, and private types in combination with origin, constituted the means for specifying requirements with respect to character for approximately 9 percent and 1 percent, respectively, of the cotton submitted to arbitration for character during the period studied.

Among the objectionable features of specifying character requirements in terms of origin are: (1) The limits of the areas included under the various geographic designations are not well defined, (2) cotton grown in a given area is not uniform in quality either throughout the area for a given year, or in a given locality over a period of years, and (3) there is at present no satisfactory means of establishing positively the origin of individual bales of cotton. Furthermore, regional descriptions, in many instances, are disadvantageous to growers and tend to discourage improvement in the quality produced. If a region has a reputation for producing cotton of inferior quality, the producers of good-quality cotton within that region may suffer from the general prejudice, and efforts to improve conditions are handicapped. On the other hand, if a locality has a reputation for producing cotton of good quality not only may cotton of poor quality from that locality bring

Table 7. - Proportionate use of various means employed for specifying requirements with respect to character of cotton submitted by domestic mills for arbitration, seasons 1929-30 to 1932-33

Means employed for specifying character	1929-30	1930-31	1931-32	1932-33	4-year average 1/
	Percent	Percent	Percent	Percent	Percent
U. S. staple standards.....	3.1	8.6	1.5	1.1	3.8
Private type.....	96.5	72.9	86.5	79.2	86.9
Origin.....	-	-	.1	.1	-
U. S. staple standards and origin.....	.1	16.9	11.3	19.6	8.7
Private types and origin.....	.3	1.6	.6	-	.6
Total.....	100.0	100.0	100.0	100.0	100.0

Data compiled from records of trade arbitration boards.

1/ Based on total bales involved during 4-year period.

undeserved premiums, but there is an incentive to capitalize the reputation of the locality by shipping cotton into it from other sections and then reshipping it to mills that designate that locality of growth in their purchase specifications. As a matter of principle, therefore, it is in the interest of growers as well as spinners to describe the elements of quality in raw cotton on the basis of inherent physical characteristics rather than in terms of locality or region of its growth.

In the absence of standards for character, however, the designation of origin to supplement the staple standards in most instances would be relatively effective if a satisfactory means for the permanent identification of bales from gin to cotton mill were available which would definitely establish the place of growth of individual bales, and if the limits of the various producing areas were more definitely defined. The solution of the problem of permanent identification of bales and the defining of the limits of specific producing areas probably can precede the solution of the problem of standards for character. Thus in the meantime, this supplementary means for specifying quality could be advantageously used under certain circumstances.

But it must be recognized that because of the lack of uniformity in the quality of cotton produced in any given area, attributable to growth conditions as well as to differences in varieties grown, the ultimate effectiveness of specifications in terms of locality of growth must depend upon the further development of single-variety communities accompanied by some system of field classification with respect to growth conditions each season.

Since character as a factor of quality is ordinarily taken into account in evaluating raw cotton from the standpoint of spinning utility,

the need for expanding the official standards to include the element of character is clearly apparent. There are a number of technological and practical problems involved in providing standards for character that have not been solved. 10/

#### EXTENT TO WHICH OFFICIAL STANDARDS MEET MILL NEEDS

Considering the present official standards collectively, 38 percent of the mills interviewed declared them to be satisfactory in all respects for the purpose of describing the qualities of cotton required. They were considered only partially satisfactory in the case of 40 percent of the mills, about 16 percent did not consider them at all satisfactory, and the remaining 6 percent had not had experience with any of the official standards.

In general, the reasons assigned for not using the official standards by the mills that use other methods for describing quality may be summarized as follows:

(1) The official standards do not conform to the mill buyer's ideas with respect to the various grade and staple designations.

(2) The orders establishing the official grade standards provide for offsetting better quality in one grade factor against deficiencies with respect to another factor, hence unsuitable color, leaf, or preparation may have to be accepted if purchases are based on the standards.

(3) The official standards are changed frequently, and mills using them would have to make corresponding adjustments in specifications stated in terms of the standards in order to continue receiving cotton of a given quality.

(4) The element of character is not adequately provided for in the official standards, hence the use of private types or the purchase on actual samples is necessary to insure the securing of cotton of the character desired.

(5) The mill buyer has not had experience with the official standards and is satisfied with methods of purchasing on the basis of private types or actual samples.

The experience of those mills using the official grade standards with satisfactory results, under conditions requiring precision in procuring cotton of given qualities, indicates a lack of foundation for the fear, on the part of those spinners not making full use of these stand-

ards, that to specify their requirements in terms of standard grade descriptions may compel the acceptance of cotton unsuitable with respect to certain factors of grade. In such instances there is an apparent lack of knowledge of the official grade standards and of the flexibility of their use. With a proper understanding of these standards, mills could so make use of them as to meet almost every conceivable need. This would involve, in some instances, the designation of specific positions in the grade boxes for each grade factor separately rather than the average of the box of a given grade. Some mills find it advisable to specify definite positions in different grade boxes for each of the factors of grade.

Apparently this practice of "subgrading" is not objectionable from the standpoint of those marketing agencies which recognize the fact that with improvements in cotton manufacturing there is a tendency to base transactions in raw cotton on finer graduations in quality factors and those which attempt to supply the precise requirements of their mill customers.

Many manufacturers thought that the official standards are being changed continuously. Apparently they were not familiar with the provisions of the statutes that require public notice for at least 1 year before changes become effective after they have been approved by the Secretary of Agriculture, and with the precautions that are taken to guard against variations when key sets of the standards are prepared and approved in conference with all interested parties.

Although the cotton industry should not be required to adjust itself to frequent changes in the official standards, it should be recognized that significant changes in the quality of the cotton crop, changes in the technic of textile manufacturing, and advances in the precision with which quality factors may be measured or evaluated make it not only necessary but advantageous to the cotton industry that the official cotton standards be revised from time to time. Such revision can be made only in accordance with statutory procedure and after due notice to the industry.

Although the element of character is not fully provided for in the present standards, this fact is probably not of sufficient importance to account for the extent to which private types are continued in use instead of the official standards for length of staple. The results of this study indicate that many of the mills that were not making full use of the official standards lacked knowledge of these standards and of the possibilities of their use.

#### EXTENT TO WHICH COTTON MEETS PURCHASE SPECIFICATIONS

Shipments of cotton received by domestic cotton mills vary considerably in the extent to which they meet purchase specifications for various elements of quality. About 7 percent of the cotton received by

Table 8. - Percentages of raw cotton receipts at domestic mills falling below purchase specifications by quality factors and staple length groups, season 1930-31

Quality factor	All mills	Mills grouped according to staple length of major part of cotton consumed		
		Shorter than 1 inch	1 to 1-3/32 inches	1-1/8 inches and longer
	Percent	Percent	Percent	Percent
Grade				
Color.....	3.49	3.46	1.55	7.67
Leaf.....	2.87	2.90	2.77	2.99
Preparation.....	2.53	1.95	1.04	7.61
Staple.....	7.21	7.94	6.76	5.57
Character.....	1.28	2.11	.28	.44

Estimates based on data obtained through a survey of domestic cotton mills.

mills during the season 1930-31 was below purchase specifications for staple length, about 1 percent failed to meet requirements from the standpoint of character. Deficiencies with respect to the grade factors amounted to slightly more than 3 percent of total receipts for color, less than 3 percent for leaf, and less than 3 percent for preparation (table 8). In some instances the same bales were deficient in two or more factors of quality.

The data indicate that for all shipments to domestic mills deficiencies with respect to the various grade factors were considerably less in extent for cotton of medium and short staples than for long-staple cotton. The percentages falling below specifications for color were 3.46, 1.55, and 7.67, respectively, for cotton shorter than 1 inch, from 1 inch to 1-3/32 inches inclusive and 1-1/8 inches and longer in staple. This situation was particularly pronounced with respect to preparation. Only 1.95 percent of the cotton under 1 inch in staple length was below purchase specifications because of preparation, whereas about 7.61 percent of the cotton 1-1/8 inches and longer was below specifications for this factor. The percentages of cotton falling below specifications for leaf, on the other hand, were approximately equal for each of the staple-length groups.

The percentage of cotton falling below specifications for length of staple was slightly greater for the shorter than for the longer staples. Deficiencies because of character were, slightly less for the long than for the medium and short staples.

Cotton reported to be above purchase specifications for quality was materially less than that reported as falling below specifications. About 2.04 percent of all receipts were reported to be above specifica-

Table 9. - Percentages of raw-cotton receipts at domestic mills classing above purchase specifications by quality factors and staple length groups, season 1930-31

Quality factor	All mills	Mills grouped according to staple length of major part of cotton consumed		
		Shorter than 1 inch	1 to 1-3/32 inches	1-1/8 inches and longer
	Percent	Percent	Percent	Percent
Grade				
Color	2.04	1.26	0.72	7.54
Leaf	.65	.63	.23	1.60
Preparation	.46	.20	.15	1.97
Staple	.96	.36	1.61	1.71
Character	.14	.15	.05	.28

Estimates based on data obtained through a survey of domestic cotton mills.

tions for color; 0.65 percent above specifications for leaf, 0.46 percent above for preparation, 0.96 percent above for staple, and 0.14 percent above for character (table 9). Evidently selling agencies ordinarily ship cotton of a wider range in quality in the case of cotton of the longer than of the shorter staples since a greater percentage of the receipts of mills was reported to be above specifications for the longer staples as was the case also for cotton falling below specifications.

The data relative to the extent to which cotton shipped to domestic mills fails to meet the precise specifications of the contracts under which purchased are based on determinations of quality made by the mills' own classers, except when the cotton was submitted to an arbitration board. The classification or comparison may or may not have been accurately made on the official standards or on the private types specified. Since the classification was not made or supervised by official classers, information as to the accuracy of the classing is not available.

Conditions under which cotton is classed at mills should also be taken into account in any consideration of the extent to which the cotton meets purchase specifications. Frequently cotton is classed at domestic mills under conditions that are not the most favorable from the standpoint of insuring accurate results. Only about 13 percent of the mills included in this study made a practice of conditioning samples before classing and of classing the cotton under uniform conditions with respect to temperature and relative humidity. About 39 percent of the mills had classing rooms equipped with skylights. In most instances the light exposure in classing rooms was North, but in a number of instances the light exposure was West, and in a few instances East or South.

Although less than 9 percent of the cotton purchased by mills in cotton-growing States was obtained direct from growers, 47 percent of the mills located in these States purchased some cotton in this manner. Of these, 96 percent graded, and 94 percent stapled, the cotton before purchase. Apparently the classing was done in a somewhat perfunctory manner, because about 75 percent of these mills reclassified the cotton before spinning it. About 5 percent of the bales purchased direct from growers were resold.

#### METHODS OF MAKING ADJUSTMENTS FOR COTTON NOT CONFORMING TO PURCHASE SPECIFICATIONS

Methods employed in making adjustments between selling agencies and mills for shipments of cotton falling below purchase specifications may be grouped generally under three heads: (1) Arbitration, (2) voluntary replacement by seller, and (3) voluntary allowance in price. The method most commonly adopted during the 1930-31 season was that of voluntary price allowance by the seller of cotton that falls below specifications. Approximately 50 percent of all adjustments were made in this way, 39 percent were made by voluntary replacement of the cotton, and about 11 percent were by formal arbitration (table 10).

Apparently the method adopted for making these adjustments depends to a considerable extent on the quality of the cotton involved. For cotton under 1 inch in staple length almost 58 percent of the adjustments were made by price allowances to the mills, whereas only about 4 percent of the cases where cotton of this length was involved were submitted to arbitration. On the other hand, where cotton 1-1/8 inches and longer was involved, about 58 percent of the adjustments for cotton falling below specifications were by voluntary replacement on the part of the seller. In 17 percent of the cases arbitration was resorted to, and in about 25 percent adjustments were made by price allowances. The fact that replacement by the seller was used much more extensively than price allowance by mills using cotton of the longer staples, whereas the opposite situation prevailed in the case of mills using cotton of the shorter staples possibly may be explained by the fact that it is possible to use a greater range in quality of raw cotton in the manufacture of coarse yarns than for yarns of the higher counts.

The type of agency through which the cotton was purchased apparently had very little influence on the method of adjustment adopted (table 11). Voluntary allowance in price was the method most commonly used for transactions with all types of selling agencies. Mills located in cotton-growing States used arbitration in making adjustments to a greater extent than was the case with mills located in noncotton-growing States. The opposite was true in the case of voluntary replacement by the seller of cotton falling below purchase specifications.

Table 10. - Methods by which adjustments are made between domestic cotton mills and selling agencies for cotton falling below purchase specifications and percent adjusted by each method by staple length groups, season 1930-31

Method of adjustment	All mills	Mills grouped according to staple length of major part of cotton consumed		
		Shorter than 1 inch	1 to 1-3/32 inches	1-1/8 inches and longer
		Percent	Percent	Percent
Arbitration .....	11	4	28	17
Voluntary replacement.....	39	38	40	58
Voluntary price allowance .....	50	58	32	25
Total.....	100	100	100	100

Estimates based on data obtained through a survey of domestic cotton mills.

#### SUMMARY AND CONCLUSIONS

Raw cotton is supplied to domestic mills by several types of selling agencies. Shippers constitute the most important group of these agencies. They supplied, either direct or through brokers, about 45 percent of the cotton consumed by domestic mills during the season 1930-31. About 16 percent was supplied by cotton merchants, 19 percent by co-operatives, and the remainder by country merchants and buyers and by growers direct.

Approximately 47 percent of the mills located in cotton-growing States purchased some cotton direct from growers. However, only about 7 percent of all the cotton consumed by domestic mills was obtained in this way. A total of approximately 25 percent of the cotton consumed by the mills of the South was obtained from local sources, including country merchants, buyers and growers.

Brokers were a more important factor in supplying mills in the noncotton-growing States than in supplying mills located in the South.

Purchases were made through brokers to a greater extent by mills located in noncotton-growing States than by mills located in the South.

Approximately 42 percent of the total purchases of raw cotton were made at fixed prices, and 58 percent were made "on call."

For the season 1930-31 domestic cotton mills described 68 percent of their purchases of raw cotton by reference to the official standards of the United States for grade, and 48 percent of all purchases were

Table 11. - Percentages of adjustments, between domestic mills and various types of selling agencies for cotton falling below purchase specifications, made by specified methods, season 1930-31

Types of selling agency	All domestic mills				In cotton-growing States				In other States			
	Arbitra-	Voluntary	Voluntary	price	Arbitra-	Voluntary	Voluntary	price	Arbitra-	Voluntary	Voluntary	price
	tion	replace-	ment	allowance	tion	replace-	ment	allowance	tion	replace-	ment	allowance
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Growers direct.....	-	-	-	-	-	-	-	-	-	-	-	-
Country merchants and buyers.....	12	34		54	12	34		54	-	-		-
Shippers direct.....	13	26		61	14	26		60	4	24		72
Shippers through brokers.....	12	46		42	24	38		38	6	51		43
Cotton merchants.....	7	45		48	11	39		50	6	47		47
Cooperatives direct.....	12	41		47	9	35		56	18	57		25
Cooperatives through brokers.....	9	41		50	25	22		53	1	50		49
Total, all types.....	11	39		50	15	33		52	5	49		46

Estimates based on data obtained through a survey of domestic cotton mills.

based on the official standards for length of staple. Approximately 50 percent of the mills that consumed cotton of staple lengths to which the tentative standards for preparation of long-staple cotton were applicable based their purchases on these standards.

Mills not using the official standards as the basis for their purchases either relied on private types as a means of securing the qualities of cotton required or made their purchases from actual samples submitted or displayed by selling agencies.

For the 4-year period 1929-30 to 1932-33, inclusive, approximately 81 percent of the cotton involved in arbitrations in which grade was the question at issue had been purchased on the official grade standards, supplemented in some instances by the tentative standards for preparation. About 19 percent had been purchased on private types. For arbitrations in which staple was the question at issue, private types and the official staple standards had been used to an approximately equal extent as a means of specifying requirements. When character was the question at issue in arbitrations, approximately 87 percent of the cotton had been described for this element of quality in terms of private types. Specifications for character in terms of official staple standards involved only about 3 percent of the cotton submitted to arbitration. The remainder of the cotton had been described for character by various combinations of methods involving the official staple standards, private types, and origin of growth.

Among the reasons why domestic cotton mills do not use the official standards more extensively are: (1) Lack of knowledge of the possible flexibility in the use of the standards so as to permit of specifying requirements with respect to each quality factor separately, (2) indifference to developments in standardization, and (3) lack of provision in the standards for the element of character.

Specifications with respect to character are made, at present, by means of private types, by designating normal character as represented by the official standards for length of staple, by descriptive terms, or in terms of locality of growth of the cotton.

The fact that the limits of the areas included under the various geographic designations are not well defined and that the cotton grown in any given area is not uniform in quality, combined with the absence of a satisfactory means for establishing definitely the origin of individual bales of cotton, makes this method of describing requirements with respect to character somewhat unsatisfactory. In so far as a satisfactory means is available, it is to the advantage of growers as well as spinners to describe the elements of quality in raw cotton on the basis of inherent physical characteristics rather than in terms of locality of growth.

In the absence of standards for character, however, the designation of place of growth of the cotton as an adjunct to the staple standards could be used advantageously if provision were made for a permanent means of identifying individual bales of cotton and if the limits of the various producing areas were more definitely defined. The maximum effectiveness of specifications in terms of place of growth is dependent upon the further development of single-variety communities accompanied by some system of field classification as to growth conditions.

There is an indicated need for expanding the official standards to include all factors of quality ordinarily taken into account in evaluating raw cotton from the standpoint of spinning utility.

Slightly more than 3 percent of the cotton received by domestic cotton mills during the season 1930-31 was found to be below purchase specifications for color as compared with less than 3 percent for leaf, less than 3 percent for preparation, and 7 percent for staple length. About 1 percent of the receipts failed to meet requirements from the standpoint of character.

The percentages of total receipts of cotton reported to be above specifications were 2.04 percent for color, 0.65 percent for leaf, 0.46 percent for preparation, 0.96 percent for staple, and 0.14 percent for character. The percentages of receipts both below specifications and above specifications were higher for long staple than for short staple cotton,

For the most part the conditions under which cotton was classed at domestic mills were not conducive to accurate and satisfactory classing. It was not possible to ascertain the extent to which this situation was responsible for technological difficulties in manufacturing, on the one hand, or for rejections of raw cotton, on the other.

Approximately 50 percent of the adjustments between cotton mills and selling agencies for shipments of cotton falling below purchase specifications were made by means of voluntary price allowances by the seller, 39 percent were made by voluntary replacement of cotton, and about 11 percent were made by formal arbitration.

Replacement of the cotton not meeting the requirements for quality appears to be the most satisfactory basis for adjustment particularly for cotton used in the manufacture of high-count yarns, in which case the quality requirements for raw material are more rigid than for the course yarns.

It is believed that the use of the official cotton standards by domestic mills would be increased materially if their possibilities as an effective means of specifying quality requirements were more generally understood.



The more general use of the official standards by domestic mills for specifying their requirements with respect to quality in raw cotton would tend to increase the use of these standards by marketing agencies. This would make for greater uniformity in methods of describing quality which, in turn, would tend to simplify and facilitate the cotton marketing process and to reflect back to growers the quality requirements or preferences of manufacturers.

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